

Listing of Claims

1. (Currently Amended) A video communication system comprising a video encoder and a video decoder, wherein the video encoder includes:

a data hiding processing unit for performing a data hiding operation based on ~~to~~ an error information received ~~provided~~ from the video decoder, and transmitting a processed error information to the video decoder, the processed error information having a hidden data; and

a first error concealment processing unit for performing an error concealment with reference to the error information, wherein the first error concealment processing unit performs the error concealment for a frame that corresponds to the error information received from the video decoder, the error concealment generating a reference frame on which the data hiding operation is performed,

the data hiding operation including embedding a number of bits of the error information into a frame currently being encoded, said embedding performed by modifying at least one parameter of the frame currently being encoded, and

wherein the video decoder includes:

a data extraction unit for extracting an information on an error frame, providing the extracted frame information to the video encoder, and extracting the hidden data including the embedded number of bits provided from the video encoder; and

a second error concealment processing unit for performing an error concealment with reference to the extracted hidden data.

2. (Canceled)

3. (Currently Amended) The video communication system of claim 1, wherein the processed error information is a ~~reference frame number of a frame that is encoded when the video encoder performs the error concealment~~ that corresponds to the reference frame, and wherein the number of bits embedded by modifying said at least one parameter of the frame currently being encoded is indicative of the frame number.

4. (Currently Amended) The video communication system of claim 1, wherein the extracted frame information is an information that represents whether or not the error occurs in each group of blocks ~~GOB (group of block)~~.

5. (Currently Amended) The video communication system of claim 1, wherein said at least one parameter is at least one of ~~the video encoder performs the data hiding using a quantization parameter corresponding to the frame currently being encoded or with respect to an encoding video image and/or~~ a level value of a block to which a discrete cosine transform (~~DCT~~) is performed.

6. (Currently Amended) The video communication system of claim 5, wherein the level value corresponds to ~~[[is]]~~ a value obtained ~~is given~~ by dividing a discrete cosine transform coefficient by the quantization parameter.

7. (Currently Amended) The video communication system of claim 1, wherein the first and second error concealment processing units perform the error concealment by calculating an average of motion vectors of blocks surrounding an error block and performing motion compensation to a reference frame.

8. (Original) The video communication system of claim 7, wherein the surrounding blocks for obtaining the average of the motion vectors are upper and lower blocks of a block in which the error occurs.

9. (Currently Amended) A video decoder comprising:
a variable length decoding (~~VLD~~) processing unit for receiving a compressed video stream from a video encoder and performing a variable length decoding;
a data extraction unit for extracting a hidden data from the variable length decoded stream, the hidden data being transmitted using a data hiding from the video encoder, extracting an information on an error frame, and providing the extracted frame information to the video encoder; and

an error concealment processing unit for performing an error concealment with reference to the extracted hidden data, wherein the hidden data is extracted based on a number of bits of error information embedded a reference frame included in the compressed video stream, said the number of bits embedded a value of at least one parameter of the reference frame.

10. (Original) The video decoder of claim 9, wherein the hidden data is extracted during an inverse quantization.

11. (Currently Amended) The video decoder of claim 9, wherein the at least one parameter includes at least one of ~~video encoder performs the data hiding using a quantization parameter or with respect to an encoding video image and/or~~ a level value of a block to which a discrete cosine transform ~~(DCT)~~ is performed.

12. (Canceled)

13. (Currently Amended) The video decoder of claim 9, wherein the extracted frame information is an information that represents whether or not the error occurs in each group of blocks ~~GOB (group of block)~~.

14. (Currently Amended) The video decoder of claim 9, wherein the error concealment processing unit performs the error concealment by calculating an average of motion vectors of blocks surrounding an error block and performing motion compensation to a reference frame.

15. (Currently Amended) A video coding method comprising ~~the steps of:~~
extracting an error frame information at a video decoder during a decoding and providing the extracted error frame information from the video decoder to a video encoder;
performing an error concealment at the video encoder based on ~~with reference to~~ the extracted error frame information provided from the video decoder, the error concealment generating a reference frame;
performing a data hiding operation based on the ~~to a reference frame used in an error concealment,~~ the data hiding operation including embedding a number of bits of the extracted error frame information into a frame currently being encoded, said embedding performed by modifying at least one parameter of the frame currently being encoded, and
transmitting the currently encoded frame containing the embedded number of bits ~~hidden data~~ to the video decoder; and extracting the embedded number of bits ~~hidden data~~ transmitted from the video encoder at the video decoder, modifying a reference frame of a frame that is encoded, using the extracted hidden data, and performing an error concealment at the decoder.

16. (Currently Amended) The video coding method of claim 15, wherein the extracted error frame information is an information that represents whether or not the error occurs in each group of blocks ~~GOB (group of block)~~.

17. (Currently Amended) The video coding method of claim 15, wherein said at least one parameter includes at least one of ~~the video encoder performs the data hiding using a~~ quantization parameter or ~~with respect to an encoding video image and/or~~ a level value of a block to which a discrete cosine transform ~~(DCT)~~ is performed.

18. (Currently Amended) The video coding method of claim 15, wherein the video encoder and the video decoder perform the error concealment by calculating an average of motion vectors of blocks surrounding an error block and performing motion compensation to a reference frame.

19. (New) The video communication system of claim 1, wherein the data hiding operation is performed before quantization of the frame currently being encoded.

20. (New) The video coding method of claim 15, wherein the data hiding operation is performed before quantization of the frame currently being encoded.